

How reliable are milk sample data from AMS for decision support and regular recording?

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Are AMS data reliable?

- Yes, mostly

But:

- Carry-over in milk samples may disturb results
- Carry-over between 2 and 20% was detected
- Problem is accelerated by single sample per test-day
- Carry-over test is missing in ICAR guidelines

This talk: A new and effective AMS carry-over test

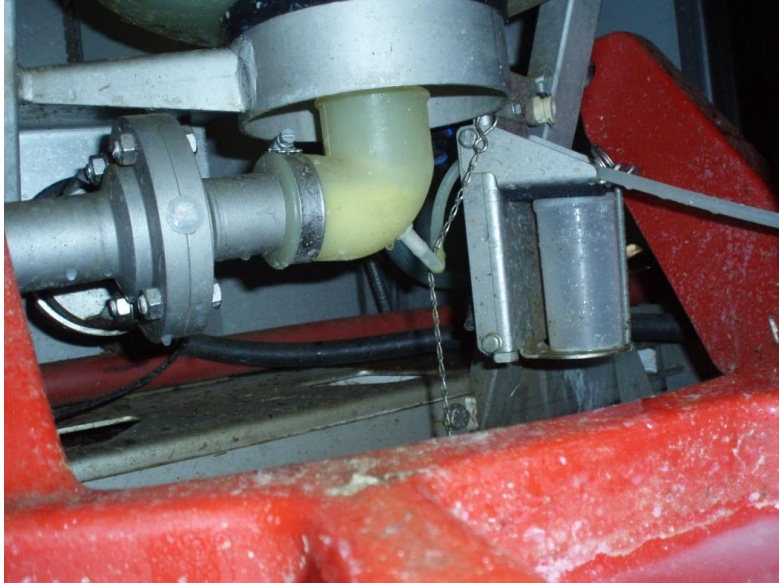
What is carry-over?

Milk from a new milking is mixed with milk from the cow(s) milked just before

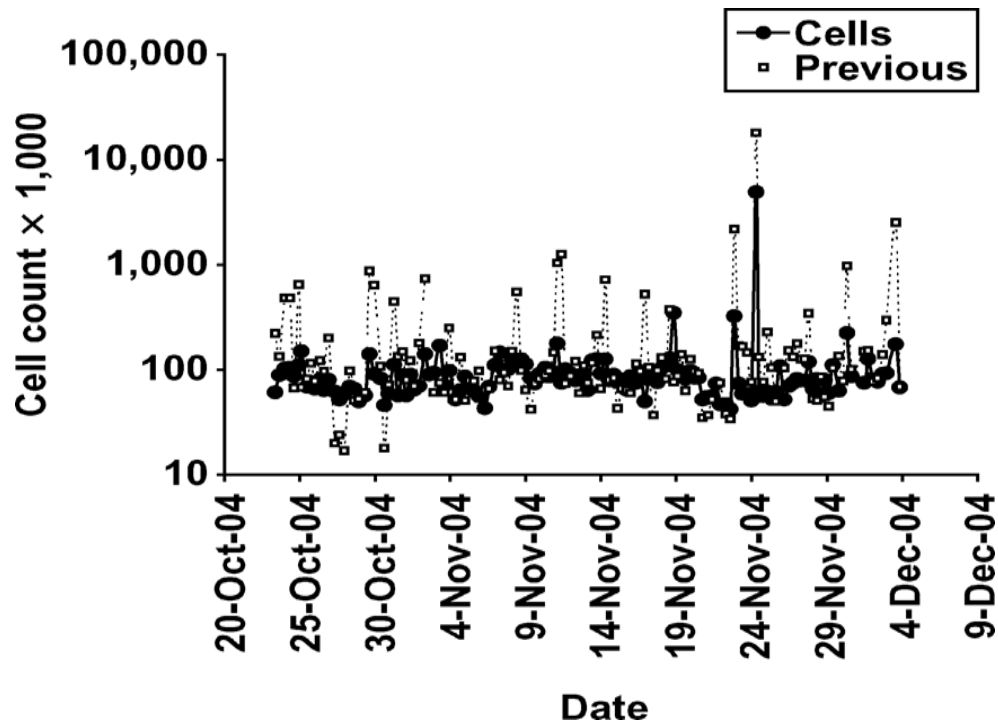
Residues in pipes, tubes, pump houses

AMS is complex => more residues are possible

Visual cause of carry-over



Carry-over example - SCC



Consequences of carry-over

- Errors on fat percentage
- Errors on cell counts
- **False alarms on PCR and ELISA**
- Need for repeated sampling
- Increased cost of recording

Estimation of carry-over

- Statistical approach¹,
 - Many samples needed
 - Complex data handling
- Tracer, coloured milk²
 - 1 day test, fast result
 - Detached, no cows

Testing method – using tracer

Protocol

Prepare warm "phantom milk":

180 L pure/ white + 180 L tracer/ yellow

Detach AMS

Phantom milkings: 2X tracer + 2X pure

Repeat milkings at 6, 10, 10, 16, 30 Kg

Clean AMS - Re-connect AMS

Analyse samples: UV-Blue - fluorescence

Calculate carry-over



Some test results

Equipment	Volume (N)	CO%, AY73	CO%, 4MeU	Average
1.A AMS Standard	5 (1)	8.4	8.5	8.5
	8 (3)	3.3	2.8	3.1
1.B	8 (6)	6.7	7.2	7.0
2 AMS Unadjusted	5 (2)	17.0	16.9	17.0
	8 (1)	20.0	19.7	19.9
3 AMS Well adjusted	6 (1)	3.1	4.6	3.9
	8 (6)	2.1	2.5	2.3
4 AMS Modified	6 (2)	10.5	10.0	10.3
	8 (3)	11.2	11.8	11.5
5 Conventional	8 (6)	3.3	3.7	3.5

A reasonable upper limit of carry-over could be 4 %

Leeuwarden workshop

Hands on trying the protocol

Analyze samples

Calculate results

Identify problems

*Prepare for "final" version
of ICAR testing protocol*



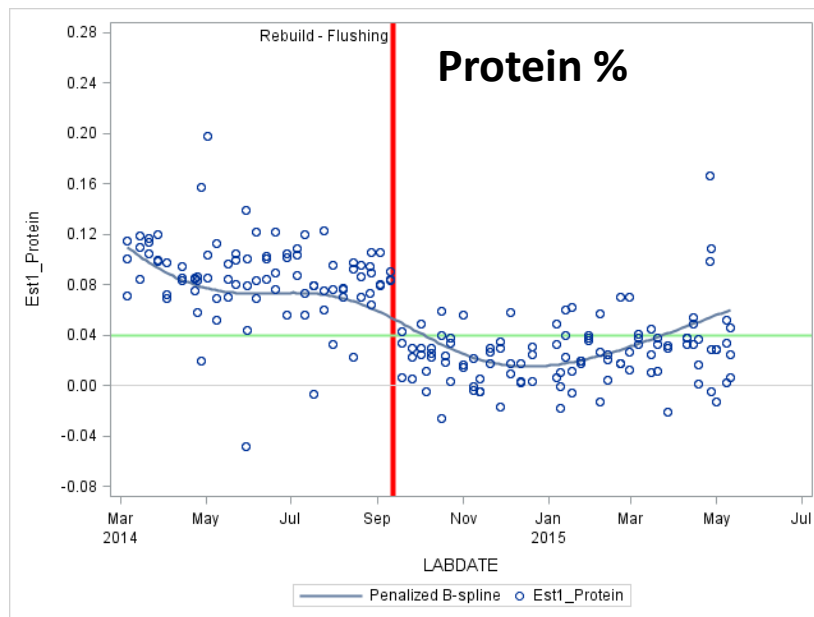
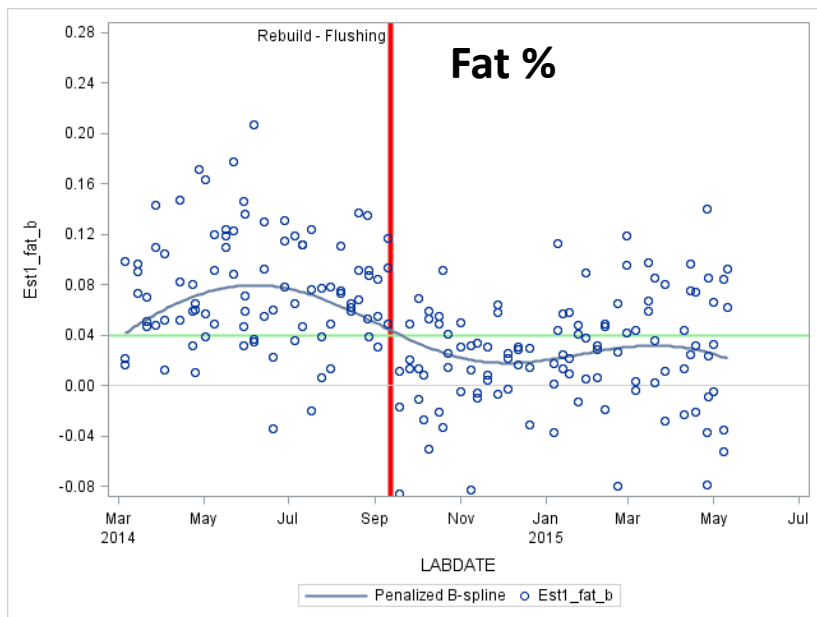
Way ahead ...

- **ICAR** to use the test for 1 yr, closed results
- **ICAR** to use the test openly, 1 yr
- The test results become part of the official approval

- **Manufacturers:** Design of new integrated AMS samplers with little carry-over
- **Users:** Rebuild of existing AMS to reduce carry over? Effective, but may give **small** BIAS on fat percent 😊 / 😞

Effects of re-build –

Monitoring data from Danish Cattle Research Center - Foulum



The fast track – to do now!

- Existing equipment can be adjusted
- Well adjusted AMS have lower carry-over
- Existing equipment need repeated adjustment as part of normal service
- Recording personnel should check adjustments as a service to herd managers

Are AMS data reliable?

- **Not always!**
- Improvements are needed – and possible
- Decision support can be modified to handle carry-over using re-sampling
- But, re-sampling is costly and give delayed response
- In-line sensors may not suffer from C-O – they use separate sampling channels
- 😊